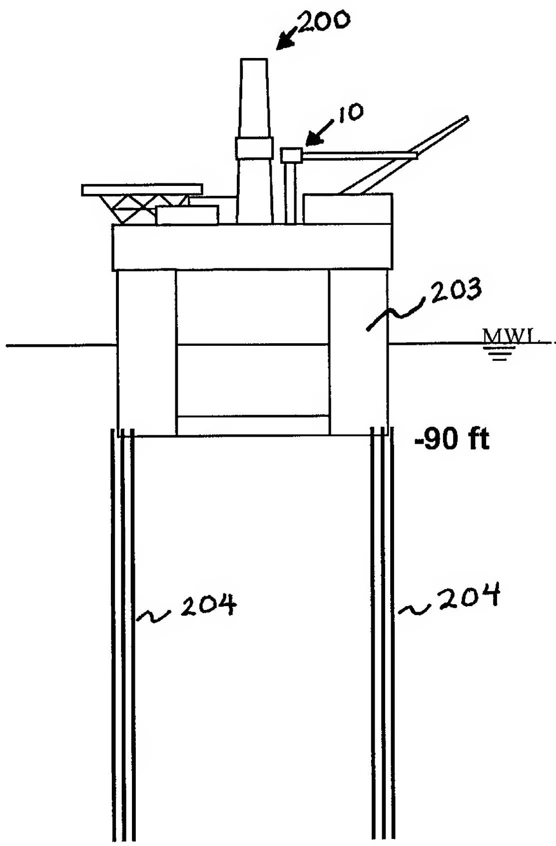
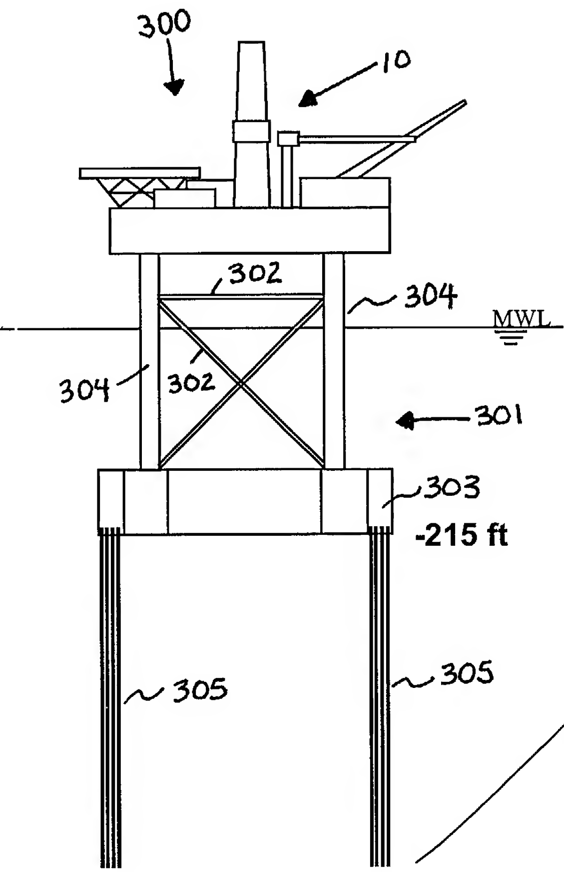
DVA concepts



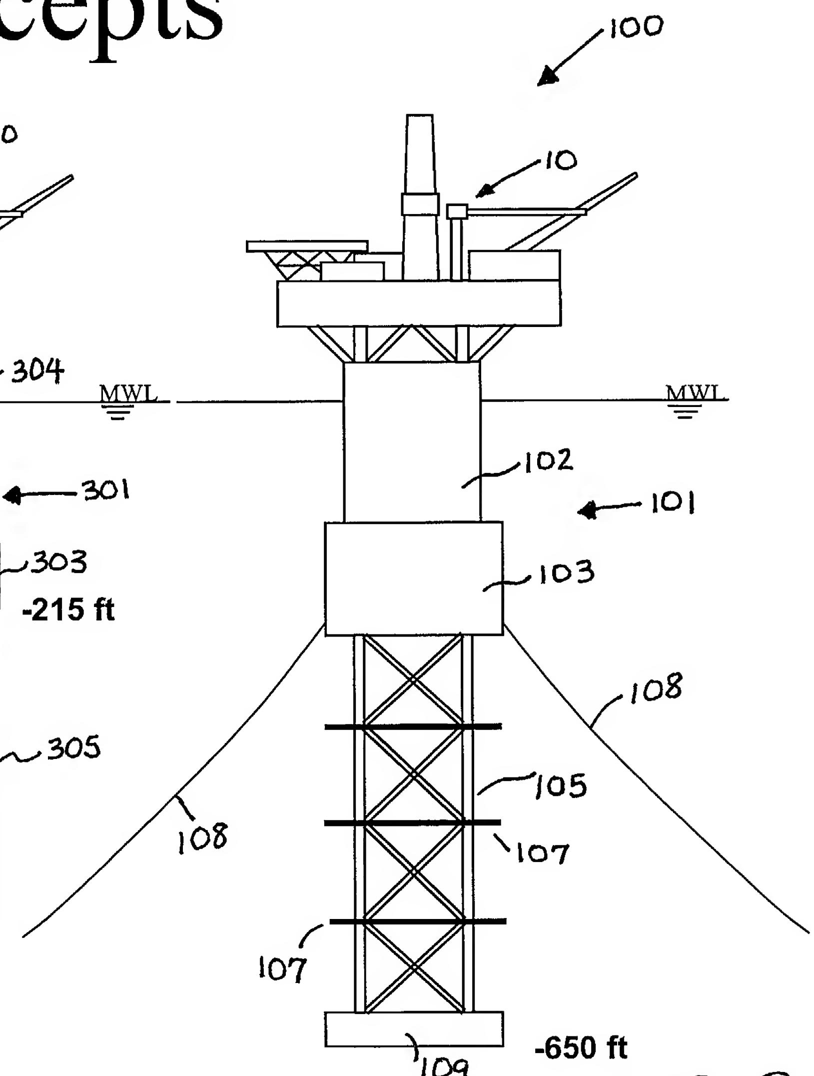
TLP

FIG. 1
(PRIOR ART)



Soft TLP

FIG. 2



Truss step spar

FIG. 3
(PRIOR ART)

A "softer" TLP

- Natural heave and pitch period around 7 sec
- Minimize wave loads (heave force and pitch/roll moment) in 7 sec seas
- Draft is 215 ft
- Small columns (14 ft diam) minimize exposure in wave zone
- Narrow pontoons (30 ft wide by 70 ft high) reduce heave added-mass
- Extensions (65 ft long) increase pitch stiffness

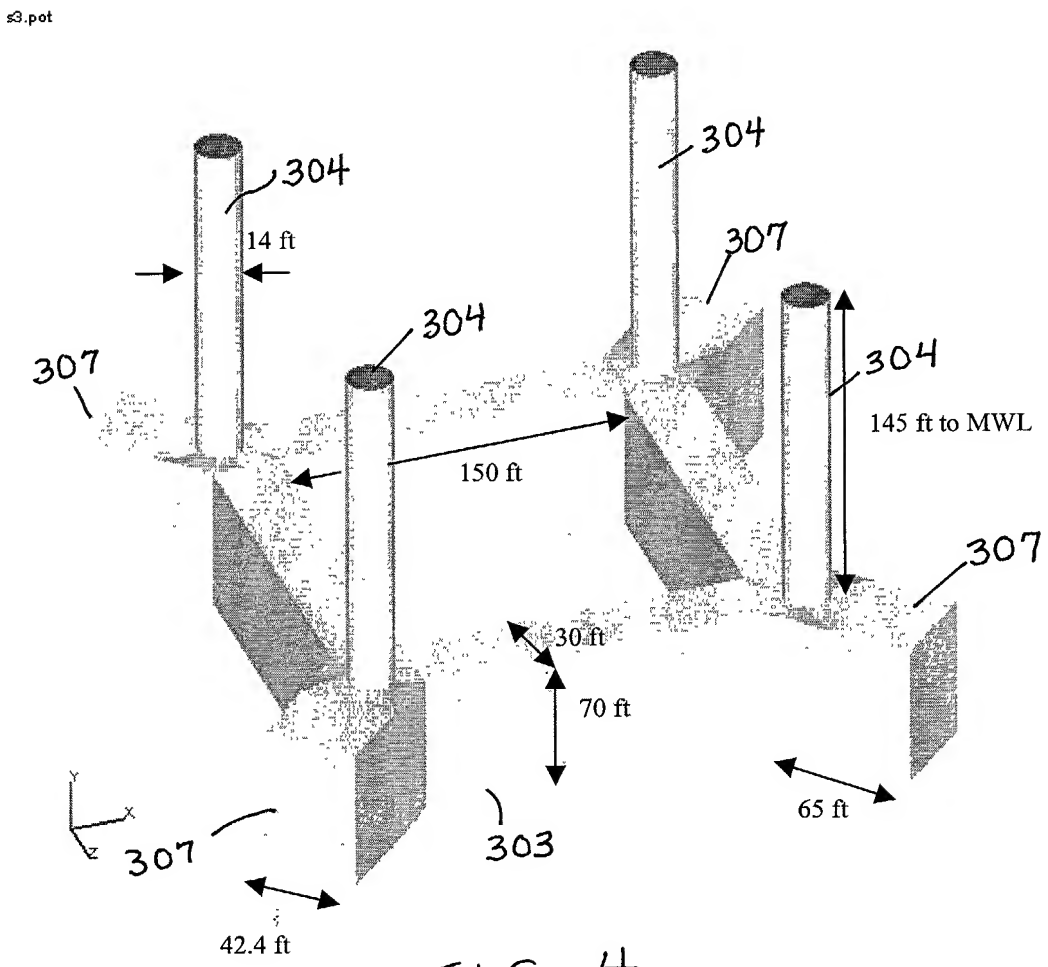
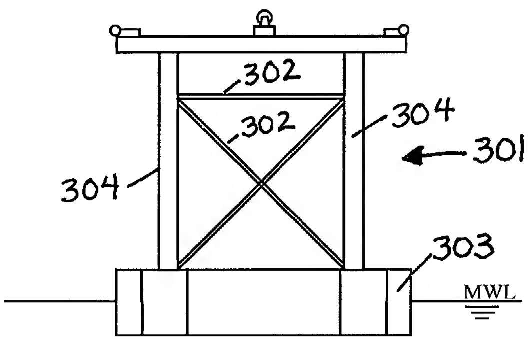


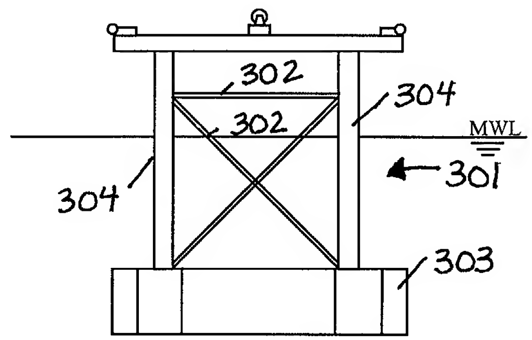
FIG. 4

Installation sequence 1/3



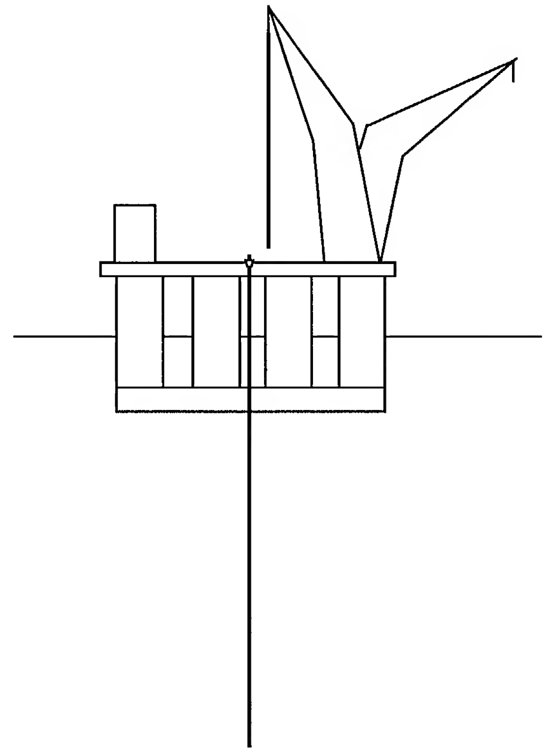
1. Hull towed to location

FIG. 5



2. Hull ballasted to –220 ft

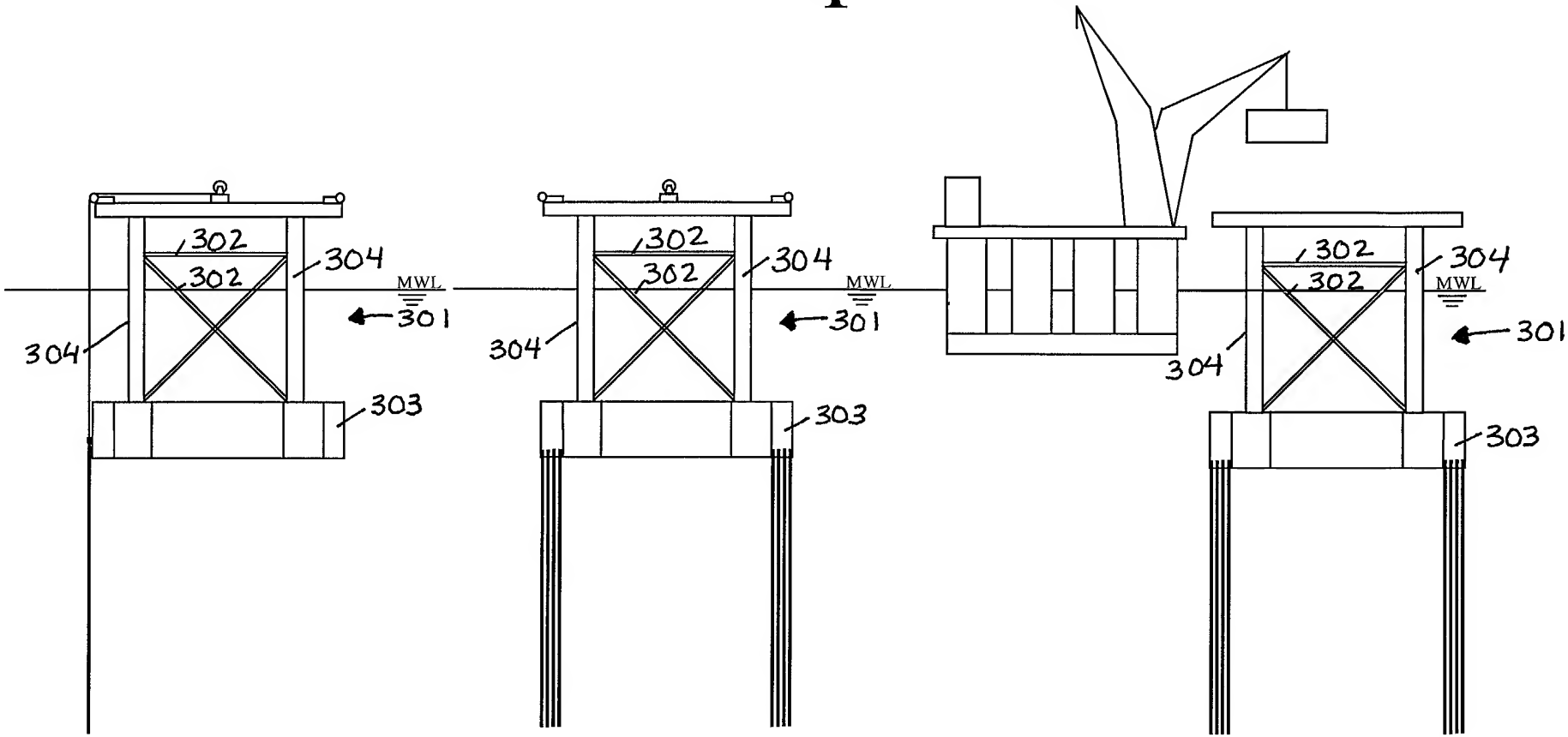
FIG. 6



3. Tendons assembled by construction vessel

FIG. 7

Installation sequence 2/3



4. Tendons passed to Soft TLP by sets of 4 and pre-connected

FIG. 8

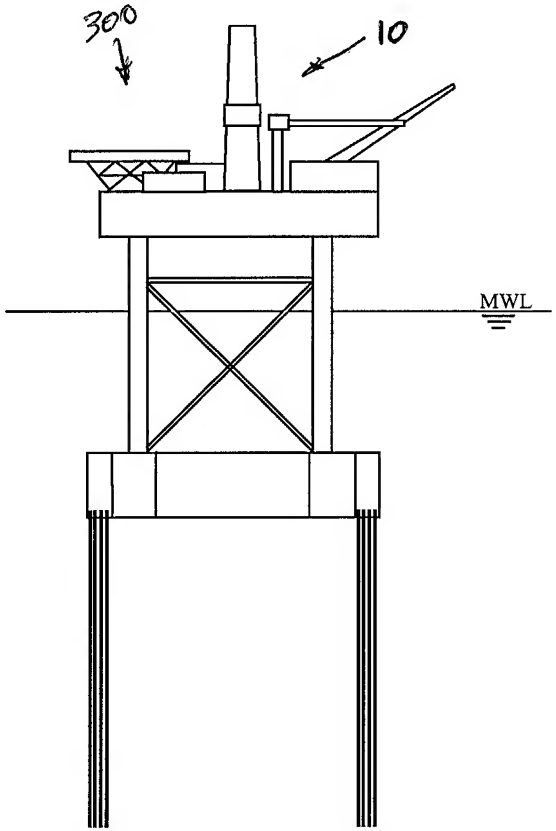
5. All tendons connected and tensioned
- platform partly de-ballasted

FIG. 9

6. Deck assembled by modules

FIG. 10

Installation sequence 3/3



7. Deck complete and platform fully de-ballasted

FIG. 11

Base case for study: carry Brutus TLP payload and functionality in 2,500 m

	short tons	Brutus	Soft TLP
Process module		4150	4150
Quarter module		3000	3000
Power module		2870	2870
Drilling module		4500	4500
Wellbay module		7700	7700
Export risers		300	750
Subsea risers		600	1500
Interconnects		270	270
Flare boom		150	150
Ballast		4000	4000
Total Payload		**27540**	**28890**

Dynamic analysis

- Diffraction-radiation (Wamit)
- Viscous load and drift forces (Perfic)
- Tendon response and global motion (Cosmos)
- Tendon fatigue (Cfpost)

DOF	Mean	Rms	Max	Min
Wave height (ft)	0.00	9.97	37.97	-37.97
Offset (ft)	223.9	16.3	276.5	171.3
Heave (ft)	-3.03	0.75	-0.25	-5.82
Pitch (deg)	-0.18	0.26	0.79	-1. 15
Yaw (deg)	-7.34	0.77	-5.12	-9.53
Bot. Tens. (kips)	2087	428	4013	161
Top tens. (kips)	3040	371	4709	1370

FIG. 13

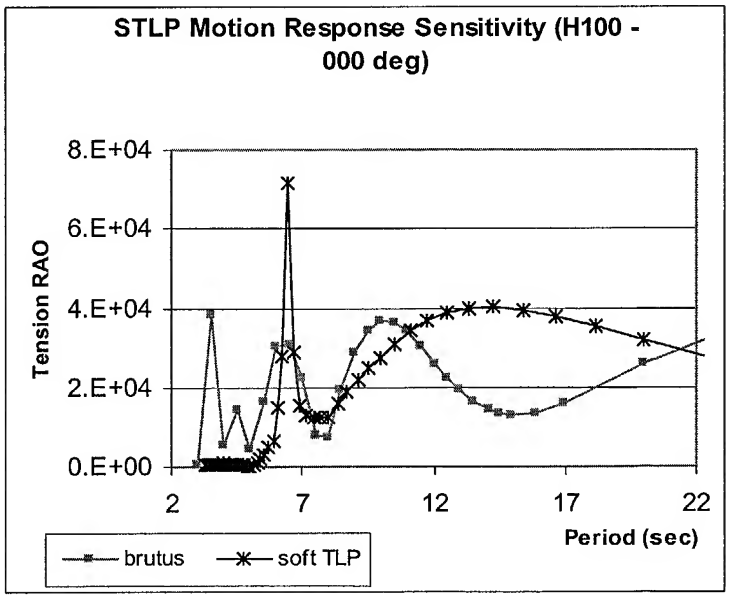


FIG. 14